Complete Summary

GUIDELINE TITLE

Screening examination of premature infants for retinopathy of prematurity.

BIBLIOGRAPHIC SOURCE(S)

Section on Ophthalmology American Academy of Pediatrics, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. Pediatrics 2006 Feb;117(2):572-6. [16 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Screening examination of premature infants for retinopathy of prematurity. Pediatrics 2001 Sep;108(3):809-11.

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Retinopathy of prematurity

GUIDELINE CATEGORY

Diagnosis
Management
Prevention
Screening

CLINICAL SPECIALTY

Family Practice
Ophthalmology
Pediatrics

INTENDED USERS

Advanced Practice Nurses
Health Care Providers
Hospitals
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To present the attributes on which an effective program for detecting and treating retinopathy of prematurity (ROP) could be based, including the timing of initial examination and subsequent reexamination intervals

TARGET POPULATION

Low birth weight premature infants in the United States

INTERVENTIONS AND PRACTICES CONSIDERED

Screening Examination and Management

1. Carefully timed retinal screening examination after pupillary dilation using binocular indirect ophthalmoscopy
2. Follow-up examinations performed at regular intervals on the basis of retinal findings
3. Ablative therapy
4. Parental counseling
5. Follow-up after hospital transfer or discharge

MAJOR OUTCOMES CONSIDERED

- Blindness
- Effectiveness of timely retinal screening examination for and early treatment of retinopathy of prematurity

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Committee)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

1. Infants with a birth weight of less than 1500 g or with a gestational age of 32 weeks or less (as defined by the attending neonatologist) and selected infants with a birth weight between 1500 and 2000 g or gestational age of more than 32 weeks with an unstable clinical course, including those requiring cardiorespiratory support and who are believed by their attending pediatrician or neonatologist to be at high risk, should have retinal screening examinations performed after papillary dilation using binocular indirect ophthalmoscopy to detect retinopathy of prematurity (ROP). One examination is sufficient only if it unequivocally shows the retina to be fully vascularized in each eye. Effort should be made to minimize the discomfort and systemic effect of this examination by pretreatment of the eyes with a topical anesthetic agent such as proparacaine; consideration also may be given to the use of pacifiers, oral sucrose, etc.
2. Retinal examinations in preterm infants should be performed by an ophthalmologist who has sufficient knowledge and experience to enable accurate identification of the location and sequential retinal changes of ROP. "The International Classification of Retinopathy of Prematurity Revisited" (International Committee for the Classification of Retinopathy of Prematurity, 2005) should be used to classify, diagram, and record these retinal findings at the time of examination.
3. The initiation of acute-phase ROP screening should be based on the infant's age. The onset of serious ROP correlates better with postmenstrual age (gestational age at birth plus chronologic age) than with postnatal age (Palmer et al., 1991). That is, the youngest infants at birth take the longest time to develop serious ROP. This knowledge has been used previously in conducting a screening schedule ("The design of the multicenter study," 1999; Hutchinson et al., 1998). The Table below was developed from an evidence-based analysis of the Multicenter Trial of Cryotherapy for Retinopathy of Prematurity natural history data and confirmed by the Light Reduction in ROP Study, which was conducted a decade later (Reynolds et al., 1998). It represents a suggested schedule for the timing of the initial eye examinations based on postmenstrual age and chronologic (postnatal) age to detect ROP before it becomes severe enough to result in retinal detachment while minimizing the number of potentially traumatic examinations (Reynolds et al., 2002). The Table provides a schedule for detecting ROP potentially damaging to the retina with 99% confidence.

Table. Timing of First Eye Examination Based on Gestational Age at Birth

Gestational Age at Birth, weeks	Age at Initial Examination, weeks	
	Postmenstrual	Chronologic
22*	31	9
23*	31	8
24	31	7
25	31	6
26	31	5
27	31	4

Gestational Age at Birth, weeks	Age at Initial Examination, weeks	
	Postmenstrual	Chronologic
28	32	4
29	33	4
30	34	4
31**	35	4
32**	36	4

Shown is a schedule for detecting prethreshold ROP with 99% confidence, usually well before any required treatment.

* This guideline should be considered tentative rather than evidence-based for infants with a gestational age of 22 to 23 weeks because of the small number of survivors in these gestational age categories.

** If necessary.

4. Follow-up examinations should be recommended by the examining ophthalmologist on the basis of retinal findings classified according to the international classification (International Committee for the Classification of Retinopathy of Prematurity, 2005). The following schedule is suggested (see Figure 1 in the original guideline document):

   1-week or less follow-up

   - stage 1 or 2 ROP: zone I
   - stage 3 ROP: zone II

   1- to 2-week follow-up

   - immature vascularization: zone I--no ROP
   - stage 2 ROP: zone II
   - regressing ROP: zone I

   2-week follow-up

   - stage 1 ROP: zone II
   - regressing ROP: zone II

   2- to 3-week follow-up

   - immature vascularization: zone II--no ROP
   - stage 1 or 2 ROP: zone III
   - regressing ROP: zone III

   The presence of plus disease (defined as dilation and tortuosity of the posterior retinal blood vessels, see below) in zones I or II suggests that peripheral ablation, rather than observation, is appropriate (Reynolds et al., 2002).

5. Practitioners involved in the ophthalmologic care of preterm infants should be aware that the retinal findings that require strong consideration of ablative treatment were revised recently according to the Early Treatment for Retinopathy of Prematurity Randomized Trial study (Early Treatment of Retinopathy of Prematurity Cooperative Group, 2003). The finding of threshold ROP, as defined in the Multicenter Trial of Cryotherapy for Retinopathy of Prematurity, may no longer be the preferred time of intervention. Treatment may also be initiated for the following retinal findings:
    - zone I ROP: any stage with plus disease
    - zone I ROP: stage 3--no plus disease
    - zone II: stage 2 or 3 with plus disease

    Plus disease is defined as a degree of dilation and tortuosity of the posterior retinal blood vessels as defined by a standard photograph ("Multicenter trial of cryotherapy," 1988; International Committee for the Classification of Retinopathy of Prematurity, 2005). Special care must be used in determining the zone of disease. The number of clock hours of disease may no longer be the determining factor in recommending ablative treatment. Treatment should generally be accomplished, when possible, within 72 hours of determination of treatable disease to minimize the risk of retinal detachment.

6. The conclusion of acute retinal screening examinations should be based on age and retinal ophthalmoscopic findings (Reynolds et al., 2002). Findings that suggest that examinations can be curtailed include the following:
    - zone III retinal vascularization attained without previous zone I or II ROP (if there is examiner doubt about the zone or if the postmenstrual age is less than 35 weeks, confirmatory examinations may be warranted)
    - full retinal vascularization
    - postmenstrual age of 45 weeks and no prethreshold disease (defined as stage 3 ROP in zone II, any ROP in zone I) or worse ROP is present; or
    - regression of ROP (Repka, Palmer, & Tung, 2000) (care must be taken to be sure that there is no abnormal vascular tissue present that is capable of reactivation and progression)

7. Communication with the parents by members of the staff is very important. Parents should be aware of ROP examinations and should be informed if their child has ROP, with subsequent updates on ROP progression. The possible consequences of serious ROP should be discussed at the time that a significant risk of poor visual outcome develops. Documentation of such conversations with parents in the nurse or physician notes is highly recommended.
8. Responsibility for examination and follow-up of infants at risk of ROP must be carefully defined by each neonatal intensive care unit (NICU). Unit-specific criteria with respect to birth weight and gestational age for examination for ROP should be established for each NICU by consultation and agreement between neonatology and ophthalmology services. These criteria should be recorded and should automatically trigger ophthalmologic examinations. If hospital discharge or transfer to another neonatal unit or hospital is contemplated before retinal maturation into zone III has taken place or if the

infant has been treated by ablation for ROP and is not yet fully healed, the availability of appropriate follow-up ophthalmologic examination must be ensured, and specific arrangement for that examination must be made before such discharge or transfer occurs. The transferring primary physician, after communication with the examining ophthalmologist, should have the responsibility for communicating what eye examinations are needed and their required timing to the infant's new primary physician. The new primary physician should ascertain the current ocular examination status of the infant from the record and through communication with the transferring physician so that any necessary examinations by an ophthalmologist with ongoing experience and expertise in examination of preterm infants for ROP can be arranged promptly at the receiving facility or on an outpatient basis if discharge is contemplated before the need for continued examination has ceased, as outlined in recommendation 6. If responsibility for arranging follow-up ophthalmologic care after discharge is delegated to the parents, they should be made to understand the potential for severe visual loss, including blindness; that there is a critical time window to be met if treatment is to be successful; and that timely follow-up examination is essential to successful treatment. This information preferably should be communicated both verbally and in writing. If such arrangements for communication and follow-up after transfer or discharge cannot be made, the infant should not be transferred or discharged until appropriate follow-up examination can be arranged by the unit that is discharging the infant.

Pediatricians and other practitioners who care for infants who have had ROP, regardless of whether they require treatment, should be aware that these infants may be at risk of other seemingly unrelated visual disorders such as strabismus, amblyopia, cataract, etc. Ophthalmologic follow-up for these potential problems after discharge from the NICU is indicated.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Identification of the relatively few preterm infants who require treatment for retinopathy of prematurity from among the much larger number of at-risk

infants while minimizing the number of stressful examinations required for these sick infants
- Decrease in the incidence of unfavorable structural and visual outcomes in low birth weight premature infants

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- Any screening program designed to implement an evolving standard of care has inherent defects, such as overreferral or underreferral, and by its very nature cannot duplicate the precision and rigor of a scientifically based clinical trial.
- The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Sep (revised 2006 Feb)

GUIDELINE DEVELOPER(S)

American Academy of Ophthalmology - Medical Specialty Society
American Academy of Pediatrics - Medical Specialty Society
American Association for Pediatric Ophthalmology and Strabismus - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Pediatrics

GUIDELINE COMMITTEE

American Academy of Pediatrics Section on Ophthalmology, 2003-2004

Subcommittee on Retinopathy of Prematurity, 2003-2005

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

Electronic copies: Available from the American Academy of Pediatrics (AAP) Policy Web site.

Print copies: Available from American Academy of Pediatrics, 141 Northwest Point Blvd., P.O. Box 927, Elk Grove Village, IL 60009-0927.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on May 15, 2003. The information was verified by the guideline developer on June 9, 2003. This NGC summary was updated by ECRI on March 31, 2006. The updated information was verified by the guideline developer on April 11, 2006.

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